

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTORNEY'S DOCKET NUMBER 1454.1124
<b>TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371</b>		
INTERNATIONAL APPLICATION NO. PCT/DE00/01948	INTERNATIONAL FILING DATE 14 June 2000	PRIORITY DATE CLAIMED 15 June 1999
TITLE OF INVENTION COMMUNICATION SYSTEM		
APPLICANT(S) FOR DO/EO/US Alexander PILGER et al.		
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:		
<p>1. <input checked="" type="checkbox"/> This is a FIRST submission of items concerning a filing under 35 U.S.C. 371.</p> <p>2. <input checked="" type="checkbox"/> This is an express request to immediately begin national examination procedures (35 U.S.C. 371(f)).</p> <p>3. <input checked="" type="checkbox"/> The US has been elected by the expiration of 19 months from the priority date (PCT Article 31).</p> <p>4. <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371(c)(2))</p> <p>a. <input checked="" type="checkbox"/> is transmitted herewith (required only if not transmitted by the International Bureau).</p> <p>b. <input type="checkbox"/> has been transmitted by the International Bureau.</p> <p>c. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US).</p> <p>5. <input checked="" type="checkbox"/> A translation of the International Application into English (35 U.S.C. 371(c)(2)).</p> <p>6. <input type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))</p> <p>a. <input type="checkbox"/> are transmitted herewith (required only if not transmitted by the International Bureau).</p> <p>b. <input type="checkbox"/> have been transmitted by the International Bureau.</p> <p>c. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US).</p> <p>7. <input type="checkbox"/> A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).</p> <p>8. <input type="checkbox"/> An oath or declaration of the inventor (35 U.S.C. 371(c)(4)).</p> <p>9. <input checked="" type="checkbox"/> A translation of the Annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).</p>		
Items 10-15 below concern document(s) or information included:		
<p>10. <input checked="" type="checkbox"/> An Information Disclosure Statement Under 37 CFR 1.97 and 1.98.</p> <p>11. <input type="checkbox"/> An assignment document for recording.</p> <p>Please mail the recorded assignment document to:</p> <p>a. <input type="checkbox"/> the person whose signature, name &amp; address appears at the bottom of this document.</p> <p>b. <input type="checkbox"/> the following:</p> <p>12. <input checked="" type="checkbox"/> A preliminary amendment.</p> <p>13. <input checked="" type="checkbox"/> A substitute specification</p> <p>14. <input type="checkbox"/> A change of power of attorney and/or address letter.</p> <p>15. <input type="checkbox"/> Other items or information:</p>		
PCT EASY forms filed with International Application, copy of cover page of International Application as published, International Search Report, and International Preliminary Examination Report.		

10/018006

 The U.S. National Fee (35 U.S.C. 371(c)(1)) and other fees as follows:

CLAIMS	(1) FOR	(2) NUMBER FILED	(3) NUMBER EXTRA	(4) RATE	(5) CALCULATIONS			
	TOTAL CLAIMS	9 -20=	0	x \$ 18.00	0.00			
	INDEPENDENT CLAIMS	1 -3=	0	x \$ 84.00	0.00			
MULTIPLE DEPENDENT CLAIM(S) (if applicable)				+\$280.00	0.00			
BASIC NATIONAL FEE (37 CFR 1.492(a)(1)-(4):								
<input type="checkbox"/> Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO .....\$1,040					890.00			
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<input type="checkbox"/> International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(2) to (4) .....\$ 100								
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		SUBTOTAL			890.00			
Processing fee of \$130 for furnishing the English Translation later than								
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Fee for recording the enclosed assignment (37 CFR 1.21(h)).					+			
		TOTAL FEES ENCLOSED			890.00			

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b.  Please charge my Deposit Account No. 19-3935 in the Amount of \$ to cover the above fees. A duplicate copy of this sheet is enclosed.

c.  The Commissioner is hereby authorized to charge any additional fees which may be required, credit any overpayment to Deposit Account No. 19-3935. A duplicate copy of this sheet is enclosed.

or



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PATENT TRADEMARK OFFICE

SUBMITTED BY: STAAS &amp; HALSEY LLP

Type Name	Richard A. Gollhofer	Reg. No.	31,106
Signature	<i>Richard A. Gollhofer</i>	Date	12/14/01

10/018006  
JC07 Rec'd PCT/PTO 14 DEC 2001  
Docket No.: 1454.1124

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of:

Alexander PILGER et al.

Serial No. Group Art Unit:

Confirmation No.

Filed: (concurrently) Examiner:

For: COMMUNICATION SYSTEM

**PRELIMINARY AMENDMENT**

Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

Before examination of the above-identified application, please amend the application as follows:

**IN THE SPECIFICATION:**

Please REPLACE the pending specification with the substitute specification attached hereto.

**IN THE CLAIMS:**

Please cancel without prejudice or disclaimer claims 1-6 in the underlying PCT application. Please also cancel, without prejudice or disclaimer claims 1-6 in the annex to the International Preliminary Examination Report (IPER) and ADD new claims in accordance with the following:

7. (NEW) A communication system utilizing a network, comprising:

    a first computer, connected to the network, including an access unit used to determine predetermined quality of service features for interaction with the network; and

    a second computer, connected to the network, to administer the quality of service features of the access unit.

8. (NEW) The communication system according to claim 7, wherein the network is the Internet.

9. (NEW) The communication system as claimed in claim 7, wherein the access unit is an autonomous device.

10. (NEW) The communication system as claimed in claim 7, wherein the access unit is a plug-in device for the first computer.

11. (NEW) The communication system as claimed in claim 7, wherein the access unit is a processor of the first computer programmed to determine predetermined quality of service features for interaction with the network.

12. (NEW) The communication system as claimed in claim 7, wherein said second computer is assigned to a service provider, in particular an Internet service provider.

13. (NEW) The communication system as claimed in claim 7, wherein said second computer is assigned to an Internet service provider.

14. (NEW) The communication system as claimed in claim 7, wherein the quality of service features are called up dynamically in the access unit.

15. (NEW) The communication system as claimed in claim 7, wherein conversion from a first protocol to a second protocol is effected in the access unit.

#### **IN THE ABSTRACT:**

Please DELETE the Abstract in its entirety and replace with the attached Substitute Abstract.

#### **REMARKS**

This Preliminary Amendment is submitted to improve the form of the English translation as filed. It is respectfully requested that this Preliminary Amendment be entered in the above-referenced application.

In accordance with the foregoing, claims 1-6 have been canceled and claims 7-15 have been added. Thus, claims 7-15 are pending and are under consideration.

A substitute specification is also being filed herewith. The substitute specification is accompanied by a marked-up copy of the original specification.

If there are any questions regarding these matters, such questions can be addressed by telephone to the undersigned. Otherwise, an early action on the merits is respectfully solicited.

If any further fees are required in connection with the filing of this Preliminary Amendment, please charge same to our Deposit Account No. 19-3935.

Respectfully submitted,

STAAS & HALSEY LLP

Date: 12/14/01

By: Richard A. Gollhofer  
Richard A. Gollhofer  
Registration No. 31,106

700 Eleventh Street, NW, Suite 500  
Washington, D.C. 20001  
(202) 434-1500

## SUBSTITUTE SPECIFICATION

## TITLE OF THE INVENTION

## COMMUNICATION SYSTEM

## CROSS REFERENCE TO RELATED APPLICATIONS

**[0001]** This application is based on and hereby claims priority to German Patent Application No. 19927302.2 filed on June 15, 1999, the contents of which are hereby incorporated by reference.

## BACKGROUND OF THE INVENTION

## 1. Field of the Invention

**[0002]** The invention relates to a communications system.

## 2. Description of the Related Art

**[0003]** A communications system is known e.g. in the form of the Internet, where a multiplicity of computers exchange information via a communication network (network interconnection). In order to obtain access to the Internet, specific devices (hardware/software) are required, in particular, for a computer. By way of example, a service provider on the Internet can be dialed via a telephone line (a/b interface or ISDN) by a modem or an ISDN adapter in conjunction with suitable software and communication with the Internet can be effected by access via the service provider. In order to obtain access to the Internet via the service provider the user specifies, in particular, an access identifier after the verification of which the Internet is open (in principle) to the user. In this case, the communication takes place via a defined connection with a quality that usually varies greatly.

**[0004]** In this case, it is disadvantageous that the service provider cannot perform any individual setting whatsoever for the individual user. Thus, it is not possible, for example, in a targeted manner to interrogate and influence specific services for a user in a decentralized manner.

## SUMMARY OF THE INVENTION

**[0005]** The object of the invention consists in specifying a communications system which enables decentralized administration of quality of service features in a computer of the user.

**[0006]** In order to achieve the object, a communications system is specified, in which a first computer is provided, which is connected to a network. The first computer has an access unit

which is used to determine predetermined quality of service features for interaction with the network. A second computer is provided, which is likewise connected to the network and administers the quality of service features of the access unit.

**[0007]** Preferably, the first computer is a terminal of a user and the second computer is, in particular, a unit of a service provider. Consequently, the service provider is given the opportunity to administer, i.e. in particular to enable, disable, alter, add, quality of service (QoS) features for the user in a targeted manner.

**[0008]** It is a major advantage precisely in the case of transmission of voice data, images and moving images e.g. to monitor the quality of the channel in the access unit. If the user and the service provider have agreed that data will be transmitted in a volume of 5 MB via a higher-quality connection, then a low-quality connection is used for data lying above the 5 MB limit. In order to supervise this agreement during access on the part of the service provider, the network load initially arises for the higher-quality connection even above the agreed 5 MB. The sixth megabyte is rejected by the service provider after the sixth megabyte has already loaded the higher-quality connection. By the communication network presented here, the sixth megabyte can automatically be transmitted with the low-quality connection by regulation of the transmission in the access unit at the location of the user. The non-agreed loading of the non-agreed sixth megabyte on the higher-quality connection does not even actually arise.

**[0009]** This scenario is an exemplary embodiment of a possible utilization of the access unit by the service provider. In this case, it should be noted that the example is based on (at least) two connections of different quality. This means that different data rates are possible in accordance with a quality of service. Different costs for the connections of different quality are expediently agreed with the service provider. It may be expedient precisely for real-time applications, e.g. video telephony, to keep a higher bandwidth available in order thus to ensure the functionality of the real-time application.

**[0010]** The point in the communication network at which the agreements made between the service provider and the user (or the latter's computer) are supervised is also referred to as the Policy Enforcement Point (PEP).

**[0011]** Furthermore, it should be noted that data with regard to the quality of service features can be stored in the access unit or, as an alternative, can be called up via the communication network by the service provider, if appropriate with regard to the propagation time. An example of such dynamic interrogation is access control (authentication). In this case, the access unit

itself can communicate with the second computer (of the service provider) via predetermined data exchange protocol and call up the suitable data.

**[0012]** A development consists in conversion from a first (communication) protocol to a second (communication) protocol being effected in the access unit. In particular for the case where the access unit is embodied as a dedicated device, e.g. a reservation protocol RSVP or Resource Reservation Protocol is used between the first computer of the user and the access unit, which protocol, when employed within the communication network, would lead to a large network loading. Therefore, the reservation protocol RSVP is expediently converted in the access unit for the user transparently into a suitable reservation mechanism which is established in the communication network (e.g. DiffServ or Differentiated Services). In general, a multiplicity of network-specific conversions can be performed in this way, in which case it is possible to take into account, in particular, protocols which can be employed in the communication network.

**[0013]** Furthermore, it is advantageous that the linking of the access unit to the first computer is unproblematic and varied. Thus, e.g. linking via a serial interface or a USB interface (USB = Universal Serial Bus) of a commercially available personal computer can be effected. Data are exchanged between the first computer and the access unit via this interface. The user does not see what conversion to what protocol standard is performed on the other side of this interface in the access unit itself, i.e. the user need not be concerned with such details. The latter can be administered by the service provider, in particular, dynamically or statically in the access unit.

**[0014]** Another development is that the network is the Internet.

**[0015]** One refinement, moreover, is that the access unit is embodied as one of the following possibilities:

a) autonomous device:

In the form of an autonomous device, the service provider can ensure with high probability that fraudulent manipulation of the access unit is precluded. In particular, it is possible to implement structural measures (e.g. potting or sealing of the housing) which make manipulation considerably more difficult. In the case of the autonomous solution, it is advantageous, in particular, if the access unit has a dedicated processor unit with associated software. Consequently, it is possible to carry out a multiplicity of functionalities, e.g. autonomous communication of the access unit with the service provider or automatic adjustment of parameters.

b) **Plug-in Device:**

A plug-in device is to be understood to be e.g. a plug-in card for a personal computer. Such a plug-in card comprises a multiplicity of electronic circuits (hardware), which are "more secure" than mere software. However, the hardware is in the user's computer and hence no longer in the direct sphere of influence of the service provider.

c) **Software Solution:**

In principle, it is also possible to realize the functionality of the access unit in the form of software. In this case, however, increased attention must be paid to the security and authenticity of the software. If the software runs on the user's computer, then it can, in principle, easily be manipulated. However, tamperproof operation of the access unit is crucial for security-relevant or cost-relevant applications. If appropriate, the originality of the software must be ensured by suitable authenticity mechanisms of the software.

**[0016]** There are a multiplicity of possible quality of service features. The following overview represents a selection that is not exhaustive:

a) **Bandwidth:**

An important aspect for the quality of a service is the available bandwidth. A continuous data stream is of great importance particularly for real-time-relevant applications (moving images, voice, etc.). By contrast, a call-up of data from the Internet (e.g. program download) can still function completely even with a small bandwidth, except that the time duration for the call-up is long in the case of a small bandwidth. The introduction of quality of service features into a scenario such as the Internet permits a selective request/allocation of bandwidth; accordingly, there are connections whose "quality" differs.

b) **Delay:**

A further important point is the time delay before a reply is received ("PING"). The faster a computer answers, the more direct the connection, i.e. the fewer routers are interposed into the connection. In this case, too, it is possible to distinguish a fast reply as high quality from a slower reply. The delay is of critical importance precisely in the case of interaction with applications running on a remote computer.

c) **Jitter (Delay Fluctuations):**

What applies to the delay also applies in the same way to the fluctuations in the delay. If

a short delay is desired with high security, there is a need, accordingly, for a low degree of jitter in connection with a small delay.

**[0017]** In this case, it should be noted that a fixed distinction between good and bad (connection, delay, jitter) is made in the above cases. It is also possible, of course, to effect gradation to a much finer degree; it is thus possible e.g. to allocate different classes for the respective quality of service feature, each class ensuring a specific quality in each case. These classes may be allocated different costs for the user.

**[0018]** Exemplary embodiments of the invention are illustrated and explained below with reference to the drawing.

#### BRIEF DESCRIPTION OF THE DRAWINGS

**[0019]** These and other objects and advantages of the present invention will become more apparent and more readily appreciated from the following description of the preferred embodiments, taken in conjunction with the accompanying drawings of which:

Figure 1 is a block diagram of a communication network.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

**[0020]** Reference will now be made in detail to the preferred embodiments of the present invention, examples of which are illustrated in the accompanying drawings, wherein like reference numerals refer to like elements throughout.

**[0021]** Figure 1 illustrates a communication network. The communication network comprises a computer R1, to which an access unit ZE is connected. The access unit ZE is embodied as an autonomous device.

**[0022]** Quality of service features for the connection to or on the Internet INET are exchanged via an IP connection (IP = Internet Protocol) between the access unit ZE and a computer R2, which represents the service provider (ISP = Internet Service Provider). The computer R2 makes use of a database DB for determining the quality of service features which are currently permissible or required for the computer R1. If appropriate, the computer R2 communicates these parameters to the access unit ZE. In this scenario, the computer R2 serves as a decision point regarding the quality of service features within the communication network (PDP = Policy Decision Point). The access unit ZE is responsible for enforcing or monitoring the quality of service features (PEP = Policy Enforcement Point).

**[0023]** The computer R1 accesses the Internet INET either directly (see connection 101) or via the service provider ISP (see connection 102). In this case, it is ensured invisibly for the computer that the suitable or agreed quality of service features are utilized. If the user, on the computer R1, wishes to utilize for example video telephony over the Internet, then a higher bandwidth can thus be made available in an automated manner, provided that this is included in the agreements with the service provider ISP. If the user and the service provider have agreed on a specific contingent of data with a higher bandwidth, then the access unit ensures, in the event of the contingent being exceeded, that only a smaller bandwidth (other quality of service feature) is utilized.

**[0024]** Furthermore, conversion to a suitable protocol can be effected transparently in the access unit ZE, which protocol, under certain circumstances, is not supported by the computer R1. Selection or adaptation to specific protocol formats is expediently effected via the communication between access unit ZE and service provider ISP.

**[0025]** In particular the connection to the service provider ISP or to the Internet INET from the computer R1 via the access unit ZE can be effected in different ways (indicated by the Internet protocol IP in figure 1). If the computer R1 is part of a Local Area Network (LAN), then an IP connection to the service provider ISP can be established directly by the access unit ZE. If a telephone line is available instead of the LAN, then a suitable protocol stack on which the IP connection can be set up must be used by a modem. The lower layers of the protocol stack are not shown in detail in figure 1; rather, it is assumed that a logical IP connection between the computer R1 or the access unit ZE and the service provider ISP or the Internet INET arises independently of the underlying type of connection (telephone, LAN, GSM, or the like).

**[0026]** As an alternative, a plurality of service providers may be arranged within the IP connection; the functionality of the provision of the quality of service features takes place between the computer R1 and the computer R2, which, for its part, as service provider ISP, can have recourse to a connection to other service providers.

**[0027]** The invention has been described in detail with particular reference to preferred embodiments thereof and examples, but it will be understood that variations and modifications can be effected within the spirit and scope of the invention.

## ABSTRACT

### COMMUNICATION SYSTEM

A communications system is specified, in which a first computer is provided, which is connected to a network. The first computer has an access unit which is used to determine predetermined quality of service features for interaction with the network. A second computer is provided, which is likewise connected to the network and administers the quality of service features of the access unit.

## MARKED-UP COPY OF SUBSTITUTE SPECIFICATION

[Description] TITLE OF THE INVENTION

## COMMUNICATION SYSTEM

## CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application is based on and hereby claims priority to German Patent Application No. 19927302.2 filed on June 15, 1999, the contents of which are hereby incorporated by reference.

BACKGROUND OF THE INVENTION

## 1. Field of the Invention

[0002] The invention relates to a communications system.

## 2. Description of the Related Art

[0003] A communications system is known e.g. in the form of the Internet, where a multiplicity of computers exchange information via a communication network (network interconnection). In order to obtain access to the Internet, specific devices (hardware/software) are required, in particular, for a computer. By way of example, a service provider on the Internet can be dialed via a telephone line (a/b interface or ISDN) by [means of] a modem or an ISDN adapter in conjunction with suitable software and communication with the Internet can be effected by [means of] access via [said] the service provider. In order to obtain access to the Internet via the service provider the user specifies, in particular, an access identifier after the verification of which the Internet is open (in principle) to [said] the user. In this case, the communication takes place via a defined connection with a quality that usually varies greatly.

[0004] In this case, it is disadvantageous that the service provider cannot perform any individual setting whatsoever for the individual user. Thus, it is not possible, for example, in a targeted manner to interrogate and influence specific services for a user in a decentralized manner.

SUMMARY OF THE INVENTION

[0005] The object of the invention consists in specifying a communications system which enables decentralized administration of quality of service features in a computer of the user.

[0006] [This object is achieved in accordance with the features of the independent patent claims. Developments of the invention emerge from the dependent claims.]

**[0007]** In order to achieve the object, a communications system is specified, in which a first computer is provided, which is connected to a network. The first computer has an access unit which is used to determine predetermined quality of service features for interaction with the network. A second computer is provided, which is likewise connected to the network and administers the quality of service features of the access unit.

**[0008]** Preferably, the first computer is a terminal of a user and the second computer is, in particular, a unit of a service provider. Consequently, the service provider is given the opportunity to administer, i.e. in particular to enable, disable, alter, add, quality of service (QoS) features for the user in a targeted manner.

**[0009]** It is a major advantage precisely in the case of transmission of voice data, images and moving images e.g. to monitor the quality of the channel in the access unit. If the user and the service provider have agreed that data will be transmitted in a volume of 5 MB via a higher-quality connection, then a low-quality connection is used for data lying above the 5 MB limit. In order to supervise this agreement during access on the part of the service provider, the network load initially arises for the higher-quality connection even above the agreed 5 MB. The sixth megabyte is rejected by the service provider after the sixth megabyte has already loaded the higher-quality connection. By [means of] the communication network presented here, the sixth megabyte can automatically be transmitted with the low-quality connection by regulation of the transmission in the access unit at the location of the user. The non-agreed loading of the non-agreed sixth megabyte on the higher-quality connection does not even actually arise.

**[0010]** This scenario is an exemplary embodiment of a possible utilization of the access unit by the service provider. In this case, it should be noted that the example is based on (at least) two connections of different quality. This means that different data rates are possible in accordance with a quality of service. Different costs for the connections of different quality are expediently agreed with the service provider. It may be expedient precisely for real-time applications, e.g. video telephony, to keep a higher bandwidth available in order thus to ensure the functionality of the real-time application.

**[0011]** The point in the communication network at which the agreements made between the service provider and the user (or the latter's computer) are supervised is also referred to as the Policy Enforcement Point (PEP).

**[0012]** Furthermore, it should be noted that data with regard to the quality of service features can be stored in the access unit or, as an alternative, can be called up via the communication

network by the service provider, if appropriate with regard to the propagation time. An example of such dynamic interrogation is access control (authentication). In this case, the access unit itself can communicate with the second computer (of the service provider) via predetermined data exchange protocol and call up the suitable data.

**[0013]** A development consists in conversion from a first (communication) protocol to a second (communication) protocol being effected in the access unit. In particular for the case where the access unit is embodied as a dedicated device, e.g. a reservation protocol RSVP [(=) or Resource Reservation Protocol()] is used between the first computer of the user and the access unit, which protocol, when employed within the communication network, would lead to a large network loading. Therefore, the reservation protocol RSVP is expediently converted in the access unit for the user transparently into a suitable reservation mechanism which is established in the communication network (e.g. DiffServ [=] or Differentiated Services). In general, a multiplicity of network-specific conversions can be performed in this way, in which case it is possible to take into account, in particular, protocols which can be employed in the communication network.

**[0014]** Furthermore, it is advantageous that the linking of the access unit to the first computer is unproblematic and varied. Thus, e.g. linking via a serial interface or a USB interface (USB = Universal Serial Bus) of a commercially available personal computer can be effected. Data are exchanged between the first computer and the access unit via this interface. The user does not see what conversion to what protocol standard is performed on the other side of this interface in the access unit itself, i.e. [said] the user need not be concerned with such details. The latter can be administered by the service provider, in particular, dynamically or statically in the access unit.

**[0015]** Another development is that the network is the Internet.

**[0016]** One refinement, moreover, is that the access unit is embodied as one of the following possibilities:

a) autonomous device:

In the form of an autonomous device, the service provider can ensure with high probability that fraudulent manipulation of the access unit is precluded. In particular, it is possible to implement structural measures (e.g. potting or sealing of the housing) which make manipulation considerably more difficult. In the case of the autonomous solution, it is advantageous, in particular, if the access unit has a dedicated processor unit with associated software. Consequently, it is possible to carry out a multiplicity of

functionalities, e.g. autonomous communication of the access unit with the service provider or automatic adjustment of parameters.

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A plug-in device is to be understood to be e.g. a plug-in card for a personal computer. Such a plug-in card comprises a multiplicity of electronic circuits (hardware), which are "more secure" than mere software. However, the hardware is in the user's computer and hence no longer in the direct sphere of influence of the service provider.

c) Software Solution:

In principle, it is also possible to realize the functionality of the access unit in the form of software. In this case, however, increased attention must be paid to the security and authenticity of the software. If the software runs on the user's computer, then it can, in principle, easily be manipulated. However, tamperproof operation of the access unit is crucial for security-relevant or cost-relevant applications. If appropriate, the originality of the software must be ensured by suitable authenticity mechanisms of [said] the software.

**[0017]** There are a multiplicity of possible quality of service features. The following overview represents a selection that is not exhaustive:

a) Bandwidth:

An important aspect for the quality of a service is the available bandwidth. A continuous data stream is of great importance particularly for real-time-relevant applications (moving images, voice, etc.). By contrast, a call-up of data from the Internet (e.g. program download) can still function completely even with a small bandwidth, except that the time duration for the call-up is long in the case of a small bandwidth. The introduction of quality of service features into a scenario such as the Internet permits a selective request/allocation of bandwidth; accordingly, there are connections whose "quality" differs.

b) Delay:

A further important point is the time delay before a reply is received ("PING"). The faster a computer answers, the more direct the connection, i.e. the fewer routers are interposed into the connection. In this case, too, it is possible to distinguish a fast reply as high quality from a slower reply. The delay is of critical importance precisely in the case of interaction with applications running on a remote computer.

c) Jitter (Delay Fluctuations):

What applies to the delay also applies in the same way to the fluctuations in the delay. If a short delay is desired with high security, there is a need, accordingly, for a low degree of jitter in connection with a small delay.

**[0018]** In this case, it should be noted that a fixed distinction between good and bad (connection, delay, jitter) is made in the above cases. It is also possible, of course, to effect gradation to a much finer degree; it is thus possible e.g. to allocate different classes for the respective quality of service feature, each class ensuring a specific quality in each case. These classes may be allocated different costs for the user.

**[0019]** Exemplary embodiments of the invention are illustrated and explained below with reference to the drawing.

#### BRIEF DESCRIPTION OF THE DRAWINGS

**[0020]** These and other objects and advantages of the present invention will become more apparent and more readily appreciated from the following description of the preferred embodiments, taken in conjunction with the accompanying drawings of which:

Figure 1 [shows] is a block diagram of a communication network.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

**[0021]** Reference will now be made in detail to the preferred embodiments of the present invention, examples of which are illustrated in the accompanying drawings, wherein like reference numerals refer to like elements throughout.

**[0022]** Figure 1 illustrates a communication network. The communication network comprises a computer R1, to which an access unit ZE is connected. The access unit ZE is embodied as an autonomous device.

**[0023]** Quality of service features for the connection to or on the Internet INET are exchanged via an IP connection (IP = Internet Protocol) between the access unit ZE and a computer R2, which represents the service provider (ISP = Internet Service Provider). The computer R2 makes use of a database DB for determining the quality of service features which are currently permissible or required for the computer R1. If appropriate, the computer R2 communicates these parameters to the access unit ZE. In this scenario, the computer R2 serves as a decision point regarding the quality of service features within the communication

network (PDP = Policy Decision Point). The access unit ZE is responsible for enforcing or monitoring the quality of service features (PEP = Policy Enforcement Point).

**[0024]** The computer R1 accesses the Internet INET either directly (see connection 101) or via the service provider ISP (see connection 102). In this case, it is ensured invisibly for [said] the computer that the suitable or agreed quality of service features are utilized. If the user, on the computer R1, wishes to utilize for example video telephony over the Internet, then a higher bandwidth can thus be made available in an automated manner, provided that this is included in the agreements with the service provider ISP. If the user and the service provider have agreed on a specific contingent of data with a higher bandwidth, then the access unit ensures, in the event of [said] the contingent being exceeded, that only a smaller bandwidth (other quality of service feature) is utilized.

**[0025]** Furthermore, conversion to a suitable protocol can be effected transparently in the access unit ZE, which protocol, under certain circumstances, is not supported by the computer R1. Selection or adaptation to specific protocol formats is expediently effected via the communication between access unit ZE and service provider ISP.

**[0026]** In particular the connection to the service provider ISP or to the Internet INET from the computer R1 via the access unit ZE can be effected in different ways (indicated by the Internet protocol IP in figure 1). If the computer R1 is part of a Local Area Network (LAN), then an IP connection to the service provider ISP can be established directly by the access unit ZE. If a telephone line is available instead of the LAN, then a suitable protocol stack on which the IP connection can be set up must be used by [means of] a modem. The lower layers of the protocol stack are not shown in detail in figure 1; rather, it is assumed that a logical IP connection between the computer R1 or the access unit ZE and the service provider ISP or the Internet INET arises independently of the underlying type of connection (telephone, LAN, GSM, or the like).

**[0027]** As an alternative, a plurality of service providers may be arranged within the IP connection; the functionality of the provision of the quality of service features takes place between the computer R1 and the computer R2, which, for its part, as service provider ISP, can have recourse to a connection to other service providers.

**[0028]** The invention has been described in detail with particular reference to preferred embodiments thereof and examples, but it will be understood that variations and modifications can be effected within the spirit and scope of the invention.

Description**Communication System**

5 The invention relates to a communications system.

A communications system is known e.g. in the form of the Internet, where a multiplicity of computers exchange information via a communication network (network interconnection). In order to 10 obtain access to the Internet, specific devices (hardware/software) are required, in particular, for a computer. By way of example, a service provider on the Internet can be dialed via a telephone line (a/b interface or ISDN) by means of a modem or an ISDN adapter in conjunction with suitable software and 15 communication with the Internet can be effected by means of access via said service provider. In order to obtain access to the Internet via the service provider the user specifies, in particular, an access identifier after the verification of which the Internet is open (in principle) to said user. In this case, 20 the communication takes place via a defined connection with a quality that usually varies greatly.

In this case, it is disadvantageous that the service provider cannot perform any individual setting whatsoever for the 25 individual user. Thus, it is not possible, for example, in a targeted manner to interrogate and influence specific services for a user in a decentralized manner.

The object of the invention consists in specifying a 30 communications system which enables decentralized administration of quality of service features in a computer of the user.

This object is achieved in accordance with the features

of the independent patent claims. Developments of the invention emerge from the dependent claims.

In order to achieve the object, a communications system is specified, in which a first computer is provided, which is connected to a network. The first computer has an access unit which is used to determine predetermined quality of service features for interaction with the network. A second computer is provided, which is likewise connected to the network and administers the quality of service features of the access unit.

Preferably, the first computer is a terminal of a user and the second computer is, in particular, a unit of a service provider. Consequently, the service provider is given the opportunity to administer, i.e. in particular to enable, disable, alter, add, quality of service (QoS) features for the user in a targeted manner.

15 It is a major advantage precisely in the case of transmission of voice data, images and moving images e.g. to monitor the quality of the channel in the access unit. If the user and the service provider have agreed that data will be transmitted in a volume of

20 5 MB via a higher-quality connection, then a low-quality connection is used for data lying above the 5 MB limit. In order to supervise this agreement during access on the part of the service provider, the network load initially arises for the higher-quality connection even above the agreed 5 MB. The sixth

25 megabyte is rejected by the service provider after the sixth megabyte has already loaded the higher-quality connection. By means of the communication network presented here, the sixth megabyte can automatically be transmitted with the low-quality connection by regulation of the transmission in the access unit at

30 the location of the user. The non-agreed loading of the non-agreed sixth megabyte on the higher-quality connection does not even actually arise.

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This scenario is an exemplary embodiment of a possible utilization of the access unit by the service provider. In this case, it should be noted that the example is based on (at least) two connections of different quality. This means that different data rates are possible in accordance with a quality of service. Different costs for the connections of different quality are expediently agreed with the service provider. It may be expedient precisely for real-time applications, e.g. video telephony, to keep a higher bandwidth available in order thus to ensure the functionality of the real-time application.

The point in the communication network at which the agreements made between the service provider and the user (or the latter's computer) are supervised is also referred to as the Policy Enforcement Point (PEP).

Furthermore, it should be noted that data with regard to the quality of service features can be stored in the access unit or, as an alternative, can be called up via the communication network by the service provider, if appropriate with regard to the propagation time. An example of such dynamic interrogation is access control (authentication). In this case, the access unit itself can communicate with the second computer (of the service provider) via predetermined data exchange protocol and call up the suitable data.

A development consists in conversion from a first (communication) protocol to a second (communication) protocol being effected in the access unit. In particular for the case where the access unit is embodied as a dedicated device, e.g. a reservation protocol RSVP (= Resource Reservation Protocol) is used between the first computer of the user and the access unit, which protocol, when employed within the communication network, would lead to a

large network loading. Therefore, the reservation protocol RSVP is expediently converted in the access unit for the user transparently into a suitable reservation mechanism which is established in the communication network (e.g. DiffServ = Differentiated Services). In 5 general, a multiplicity of network-specific conversions can be performed in this way, in which case it is possible to take into account, in particular, protocols which can be employed in the communication network.

10 Furthermore, it is advantageous that the linking of the access unit to the first computer is unproblematic and varied. Thus, e.g. linking via a serial interface or a USB interface (USB = Universal Serial Bus) of a commercially available personal computer can be effected. Data are exchanged between the first computer and the 15 access unit via this interface. The user does not see what conversion to what protocol standard is performed on the other side of this interface in the access unit itself, i.e. said user need not be concerned with such details. The latter can be administered by the service provider, in particular, dynamically 20 or statically in the access unit.

Another development is that the network is the Internet.

One refinement, moreover, is that the access unit is embodied as 25 one of the following possibilities:

a) autonomous device:

In the form of an autonomous device, the service provider can ensure with high probability that fraudulent manipulation of the access unit is precluded. In 30 particular, it is possible to implement structural measures (e.g. potting or sealing of the housing) which make manipulation considerably more difficult. In the case of the autonomous solution, it is advantageous,

5

in particular, if the access unit has a dedicated processor unit with associated software. Consequently, it is possible to carry out a multiplicity of functionalities, e.g. autonomous communication of the access unit with the service provider or automatic adjustment of parameters.

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b) Plug-in Device:  
A plug-in device is to be understood to be e.g. a plug-in card for a personal computer. Such a plug-in card comprises a multiplicity of electronic circuits (hardware), which are "more secure" than mere software. However, the hardware is in the user's computer and hence no longer in the direct sphere of influence of the service provider.

15

20

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c) Software Solution:

In principle, it is also possible to realize the functionality of the access unit in the form of software. In this case, however, increased attention must be paid to the security and authenticity of the software. If the software runs on the user's computer, then it can, in principle, easily be manipulated. However, tamperproof operation of the access unit is crucial for security-relevant or cost-relevant applications. If appropriate, the originality of the software must be ensured by suitable authenticity mechanisms of said software.

30

There are a multiplicity of possible quality of service features. The following overview represents a selection that is not exhaustive:

a) Bandwidth:

An important aspect for the quality of a

service is the available bandwidth. A continuous data stream is of great importance particularly for

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real-time-relevant applications (moving images, voice, etc.). By contrast, a call-up of data from the Internet (e.g. program download) can still function completely even with a small bandwidth, except that the time duration for the call-up is long in the case of a small bandwidth. The introduction of quality of service features into a scenario such as the Internet permits a selective request/allocation of bandwidth; accordingly, there are connections whose "quality" differs.

10

b) Delay:

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A further important point is the time delay before a reply is received ("PING"). The faster a computer answers, the more direct the connection, i.e. the fewer routers are interposed into the connection. In this case, too, it is possible to distinguish a fast reply as high quality from a slower reply. The delay is of critical importance precisely in the case of interaction with applications running on a remote computer.

20

c) Jitter (Delay Fluctuations):

25

What applies to the delay also applies in the same way to the fluctuations in the delay. If a short delay is desired with high security, there is a need, accordingly, for a low degree of jitter in connection with a small delay.

30

In this case, it should be noted that a fixed distinction between good and bad (connection, delay, jitter) is made in the above cases. It is also possible, of course, to effect gradation to a much finer degree; it is thus possible e.g. to allocate different classes for the respective quality of service feature, each class ensuring a specific quality in each

case. These classes may be allocated different costs for the user.

Exemplary embodiments of the invention are illustrated and explained below with reference to the drawing.

Figure 1 shows a communication network.

5

Figure 1 illustrates a communication network. The communication network comprises a computer R1, to which an access unit ZE is connected. The access unit ZE is embodied as an autonomous device.

10 Quality of service features for the connection to or on the Internet INET are exchanged via an IP connection (IP = Internet Protocol) between the access unit ZE and a computer R2, which represents the service provider (ISP = Internet Service Provider). The computer R2 makes use of a database DB for determining the  
15 quality of service features which are currently permissible or required for the computer R1. If appropriate, the computer R2 communicates these parameters to the access unit ZE. In this scenario, the computer R2 serves as a decision point regarding the quality of service features within the communication network (PDP = Policy Decision Point). The access unit ZE is responsible for  
20 enforcing or monitoring the quality of service features (PEP = Policy Enforcement Point).

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25 connection 101) or via the service provider ISP (see connection 102). In this case, it is ensured invisibly for said computer that the suitable or agreed quality of service features are utilized. If the user, on the computer R1, wishes to utilize for example video telephony over the Internet, then a higher bandwidth can  
30 thus be made available in an automated manner, provided that this is included in the agreements with the service provider ISP. If the user and the service provider have agreed on a specific contingent of data with a higher bandwidth, then the access unit ensures,

in the event of said contingent being exceeded, that only a smaller bandwidth (other quality of service feature) is utilized.

Furthermore, conversion to a suitable protocol can be effected 5 transparently in the access unit ZE, which protocol, under certain circumstances, is not supported by the computer R1. Selection or adaptation to specific protocol formats is expediently effected via the communication between access unit ZE and service provider ISP.

10

In particular the connection to the service provider ISP or to the Internet INET from the computer R1 via the access unit ZE can be effected in different ways (indicated by the Internet protocol IP in figure 1). If the computer R1 is part of a Local Area Network 15 (LAN), then an IP connection to the service provider ISP can be established directly by the access unit ZE. If a telephone line is available instead of the LAN, then a suitable protocol stack on which the IP connection can be set up must be used by means of a modem. The lower layers of the protocol stack are not shown in 20 detail in figure 1; rather, it is assumed that a logical IP connection between the computer R1 or the access unit ZE and the service provider ISP or the Internet INET arises independently of the underlying type of connection (telephone, LAN, GSM, or the like).

25

As an alternative, a plurality of service providers may be arranged within the IP connection; the functionality of the provision of the quality of service features takes place between the computer R1 and the computer R2, which, for its part, as 30 service provider ISP, can have recourse to a connection to other service providers.

andere Begriffe

Patent Claims

1. A communications system,  
in which a first computer (R1) is provided, which is  
5 connected to a network,  
characterized  
in that the first computer has an access unit (ZE) which is  
used to determine predetermined quality of service features  
for interaction with the network,  
10 and in that a second computer (R2) is provided, which is  
connected to the network and administers the quality of  
service features of the access unit.
2. The communications system according to claim 1,  
15 in which the network is the Internet (INET).
3. The communications system as claimed in claim 1 or 2, in  
which the access unit is embodied as:  
20 a) an autonomous device;  
b) a plug-in device for the first computer;  
c) a software solution for the first computer.
4. The communications system as claimed in one of the preceding  
claims,  
25 in which the second computer is assigned to a service  
provider
5. The communications system as claimed in one of the preceding  
claims,  
30 in which the access unit is present in such a way that the  
quality of service features are called up dynamically.

6. The communication system as claimed in one of the preceding claims,  
in which the access unit is present in such a way that conversion from a first protocol to a second protocol is effected.

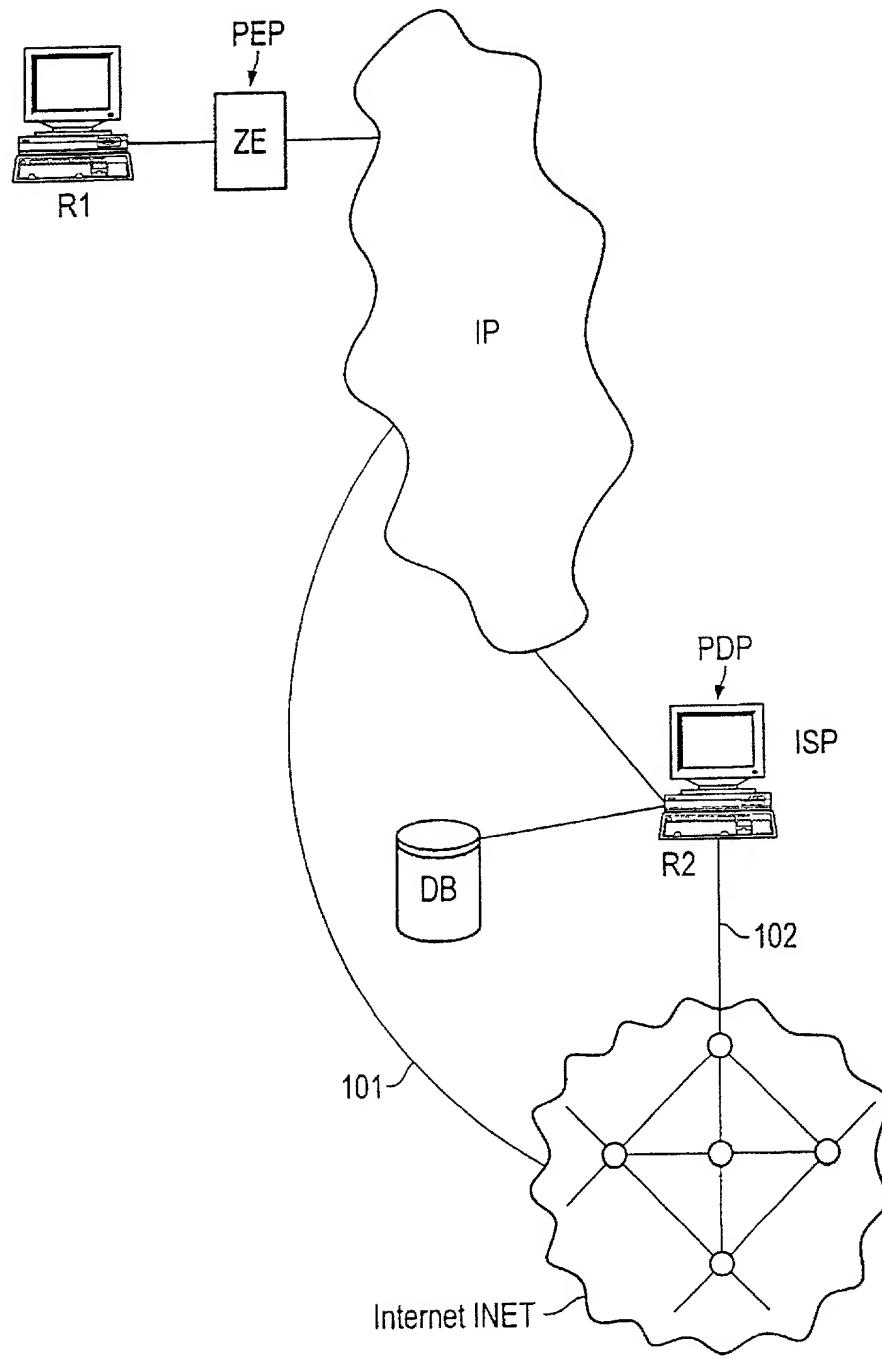
Abstract

**Communications system**

A communications system is specified, in which a first computer is provided, which is connected to a network. The first computer has an access unit which is used to determine predetermined quality of service features for interaction with the network. A second computer is provided, which is likewise connected to the network and administers the quality of service features of the access unit.

figure 1

1/1



# Declaration and Power of Attorney For Patent Application

## Erklärung Für Patentanmeldungen Mit Vollmacht

### German Language Declaration

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Als nachstehend benannter Erfinder erkläre ich hiermit an Eides Statt:

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#### Kommunikationssystem

deren Beschreibung

(zutreffendes ankreuzen)

hier beigelegt ist.

am 14.06.2000 als

PCT internationale Anmeldung

PCT Anmeldungsnummer PCT/DE00/01948

eingereicht wurde und am \_\_\_\_\_

abgeändert wurde (falls tatsächlich abgeändert).

Ich bestätige hiermit, dass ich den Inhalt der obigen Patentanmeldung einschliesslich der Ansprüche durchgesehen und verstanden habe, die eventuell durch einen Zusatzantrag wie oben erwähnt abgeändert wurde.

Ich erkenne meine Pflicht zur Offenbarung irgendwelcher Informationen, die für die Prüfung der vorliegenden Anmeldung in Einklang mit Absatz 37, Bundesgesetzbuch, Paragraph 1.56(a) von Wichtigkeit sind, an.

Ich beanspruche hiermit ausländische Prioritätsvorteile gemäss Abschnitt 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 119 aller unten angegebenen Auslandsanmeldungen für ein Patent oder eine Erfindersurkunde, und habe auch alle Auslandsanmeldungen für ein Patent oder eine Erfindersurkunde nachstehend gekennzeichnet, die ein Anmelde- datum haben, das vor dem Anmelde- datum der Anmeldung liegt, für die Priorität beansprucht wird.

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My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

#### Communication system

the specification of which

(check one)

is attached hereto.

was filed on 14.06.2000 as

PCT international application

PCT Application No. PCT/DE00/01948

and was amended on \_\_\_\_\_

(if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

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Prior foreign applications  
Priorität beansprucht

Priority Claimed

(Number) - (Country) (Day Month Year Filed) Yes  No   
(Nummer) (Land) (Tag Monat Jahr eingereicht) Ja  Nein

(Number)    (Country)    (Day Month Year Filed)     Yes  No  
(Nummer)    (Land)    (Tag Monat Jahr eingereicht)     Ja  Nein

Ich beanspruche hiermit gemäss Absatz 35 der Zivilprozeßordnung der Vereinigten Staaten, Paragraph 120, den Vorzug aller unten aufgeführten Anmeldungen und falls der Gegenstand aus jedem Anspruch dieser Anmeldung nicht in einer früheren amerikanischen Patentanmeldung laut dem ersten Paragraphen des Absatzes 35 der Zivilprozeßordnung der Vereinigten Staaten, Paragraph 122 offenbart ist, erkenne ich gemäss Absatz 37, Bundesgesetzbuch, Paragraph 1.56(a) meine Pflicht zur Offenbarung von Informationen an, die zwischen dem Anmeldedatum der früheren Anmeldung und dem nationalen oder PCT internationalen Anmeldedatum dieser Anmeldung bekannt geworden sind.

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §122, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application.

PCT/DE00/01948  
(Application Serial No.)  
(Anmeldeseriennummer)

14.06.2000  
(Filing Date D, M, Y)  
(Anmeldedatum T, M, J)

anhängig  
(Status)  
(patentiert, anhängig,  
aufgegeben)

pending  
(Status)  
(patented, pending,  
abandoned)

(Application Serial No.)  
(Anmeldeseriennummer)

(Filing Date D,M,Y)  
(Anmeldedatum T, M, J)

(Status)  
(patentiert, anhängig,  
aufgeben)

(Status)  
(patented, pending,  
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And I hereby appoint

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(Name und Telefonnummer)

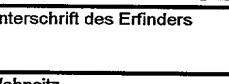
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700 Eleventh Street NW, Suite 500 20001 Washington, DC  
Telephone: (001) 202 434 1500 and Facsimile (001) 202 434 1501  
or  
Customer No. 21171

Voller Name des einzigen oder ursprünglichen Erfinders: <b>ALEXANDER PILGER</b>		Full name of sole or first inventor: <b>ALEXANDER PILGER</b>	
Unterschrift des Erfinders 	Datum <i>18.1.2002</i>	Inventor's signature	Date
Wohnsitz <b>Rohrdorf, DEUTSCHLAND</b>	Residence <b>Rohrdorf, GERMANY</b>	<i>DEX</i>	
Staatsangehörigkeit <b>DE</b>	Citizenship <b>DE</b>		
Postanschrift <b>Enzianweg 8 83101 Rohrdorf</b>	Post Office Address <b>Enzianweg 8 83101 Rohrdorf</b>		
Voller Name des zweiten Miterfinders (falls zutreffend): <b>JOACHIM SOKOL</b>		Full name of second joint inventor, if any: <b>JOACHIM SOKOL</b>	
Unterschrift des Erfinders 	Datum <i></i>	Second Inventor's signature	Date
Wohnsitz <b>UNTERHACHING, DEUTSCHLAND</b>	Residence <b>UNTERHACHING, GERMANY</b>		
Staatsangehörigkeit <b>DE</b>	Citizenship <b>DE</b>		
Postanschrift <b>UTZWEG 10 82008 UNTERHACHING</b>	Post Office Address <b>UTZWEG 10 82008 UNTERHACHING</b>		

(Bitte entsprechende Informationen und Unterschriften im Falle von dritten und weiteren Miterfindern angeben).

(Supply similar information and signature for third and subsequent joint inventors).

**Declaration and Power of Attorney For Patent Application****Erklärung Für Patentanmeldungen Mit Vollmacht****German Language Declaration**

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**Kommunikationssystem**

deren Beschreibung

(zutreffendes ankreuzen)

hier beigefügt ist.

am 14.06.2000 als

PCT internationale Anmeldung

PCT Anmeldungsnr. PCT/DE0001948

eingereicht wurde und am

abgeändert wurde (falls tatsächlich abgeändert).

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**Communication system**

the specification of which

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PCT Application No. PCT/DE00/01948

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Prior foreign applications  
Priorität beansprucht

### Priority Claimed

(Number) \_\_\_\_\_ (Country) \_\_\_\_\_ (Day Month Year Filed) \_\_\_\_\_ Yes \_\_\_\_\_ No \_\_\_\_\_  
(Nummer) \_\_\_\_\_ (Land) \_\_\_\_\_ (Tag Monat Jahr eingereicht) \_\_\_\_\_ Ja \_\_\_\_\_ Nein \_\_\_\_\_

(Number) (Country) (Day Month Year Filed) Yes  
(Nummer) (Land) (Tag Monat Jahr eingereicht) Ja  
□ □

Ich beanspruche hiermit gemäss Absatz 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 120, den Vorzug aller unten aufgeführten Anmeldungen und falls der Gegenstand aus jedem Anspruch dieser Anmeldung nicht in einer früheren amerikanischen Patentanmeldung laut dem ersten Paragraphen des Absatzes 35 der Zivilprozeßordnung der Vereinigten Staaten, Paragraph 122 offenbart ist, erkenne ich gemäss Absatz 37, Bundesgesetzbuch, Paragraph 1.56(a) meine Pflicht zur Offenbarung von Informationen an, die zwischen dem Anmeldedatum der früheren Anmeldung und dem nationalen oder PCT internationalen Anmeldedatum dieser Anmeldung bekannt geworden sind.

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §122, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application.

PCT/DE00/01948 14.06.2000 anhängig pending  
(Application Serial No.) (Filing Date D, M, Y) (Status)  
(Anmeldeseriennummer) (Anmeldedatum T, M, J) (patentiert, anhängig,  
aufgegeben) (Status)  
(patented, pending,  
abandoned)

(Application Serial No.) (Filing Date D,M,Y) (Status) (Status)  
(Anmeldeseriennummer) (Anmeldedatum T, M, J) (patentiert, anhängig,  
aufrechnen) (patented, pending,  
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Ich erkläre hiermit, dass alle von mir in der vorliegenden Erklärung gemachten Angaben nach meinem besten Wissen und Gewissen der vollen Wahrheit entsprechen, und dass ich diese eidesstattliche Erklärung in Kenntnis dessen abgebe, dass wissentlich und vorsätzlich falsche Angaben gemäss Paragraph 1001, Absatz 18 der Zivilprozeßordnung der Vereinigten Staaten von Amerika mit Geldstrafe belegt und/oder Gefängnis bestraft werden koennen, und dass derartig wissentlich und vorsätzlich falsche Angaben die Gültigkeit der vorliegenden Patentanmeldung oder eines darauf erteilten Patentes gefährden können.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

## German Language Declaration

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**POWER OF ATTORNEY:** As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. *(list name and registration number)*

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Telefongespräche bitte richten an:  
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Direct Telephone Calls to: *(name and telephone number)*

Ext. \_\_\_\_\_

Postanschrift:

Send Correspondence to:

Staas & Halsey LLP  
700 Eleventh Street NW, Suite 500 20001 Washington, DC  
Telephone: (001) 202 434 1500 and Facsimile (001) 202 434 1501  
or  
**Customer No. 21171**

Voller Name des einzigen oder ursprünglichen Erfinders: <b>ALEXANDER PILGER</b>		Full name of sole or first inventor: <b>ALEXANDER PILGER</b>	
Unterschrift des Erfinders 	Datum 8.3.02	Inventor's signature	Date
Wohnsitz <b>Rohrdorf, DEUTSCHLAND</b>	Residence <b>Rohrdorf, GERMANY</b>		
Staatsangehörigkeit <b>DE</b>	Citizenship <b>DE</b>		
Postanschrift <b>Enzianweg 8</b>	Post Office Address <b>Enzianweg 8</b>		
<b>83101 Rohrdorf</b>	<b>83101 Rohrdorf</b>		
Voller Name des zweiten Miterfinders (falls zutreffend). <b>JOACHIM SOKOL</b>		Full name of second joint inventor, if any: <b>JOACHIM SOKOL</b>	
Unterschrift des Erfinders 	Datum 8.3.02	Second Inventor's signature	Date
Wohnsitz <b>UNTERHACHING, DEUTSCHLAND</b>	Residence <b>UNTERHACHING, GERMANY</b> <b>DE</b>		
Staatsangehörigkeit <b>DE</b>	Citizenship <b>DE</b>		
Postanschrift <b>UTZWEG 10</b>	Post Office Address <b>UTZWEG 10</b>		
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